

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): An optimum command producing apparatus ~~for inputting~~ configured to receive a command, processing-process the command in such a manner that a ~~control-controlled~~ object implements a desirable operation and ~~outputting-output~~ an optimum command value to a servo control apparatus, the apparatus comprising:

an N-order filter processing section ~~for carrying~~ configured to carry out an N-order filter processing for the command and ~~calculating-calculate~~ values from a ~~1-rank 1-order~~ differential value to an ~~(N-1)-rank (N-1)-order~~ differential value of the command subjected to the filter processing, wherein N is an integer of 2 or more; and

an arithmetic unit ~~for adding~~ configured to calculate a value obtained by multiplying an ~~output of each of the values calculated by the N-order filter processing section by a gain~~ corresponding one of gains, and

wherein N is equal to or greater than a value defined by subtracting an order of the command from an order of denominator of a transfer function of an approximation model that represents the controlled object with Laplace operator.

2. (currently amended): An optimum command producing apparatus ~~for inputting~~ configured to receive a command, processing-process the command in such a manner that a

~~control~~ controlled object implements a desirable operation and ~~outputting~~ output an optimum command value to a servo control apparatus, the apparatus comprising:

an N-order filter processing section ~~for carrying~~ configured to carry out an N-order filter processing for the command and calculating values from a ~~1-rank~~ 1-order differential value to an ~~(N-1)-rank~~ (N-1)-order differential value of the command subjected to the filter processing, wherein N is an integer of 2 or more;

an arithmetic unit ~~for adding~~ configured to calculate a value obtained by multiplying ~~an~~ output of each of the values calculated by the N-order filter processing section by a ~~gain;~~ corresponding one of gains; and

an M-order filter processing section ~~for carrying out~~ configured to perform an M-order filter processing ~~over respective variables output from~~ the value calculated by the arithmetic unit ~~again~~ wherein M is an integer of 1 or more,

wherein N is equal to or greater than a value defined by subtracting an order of the command from an order of denominator of a transfer function of an approximation model that represents the controlled object with Laplace operator.

3. (currently amended): An optimum command producing apparatus ~~for inputting~~ configured to receive a command, ~~processing-process~~ the command in such a manner that a ~~control-controlled~~ object implements a desirable operation and ~~outputting-output~~ an optimum command value to a servo control apparatus, the apparatus comprising:

an N-order filter processing section ~~for carrying~~ configured to carry out an N-order filter processing for the command and ~~calculating-calculate~~ values from a ~~1-rank~~ 1-order differential

value to an L-rank L-order differential value of the command subjected to the filter processing,
wherein N is an integer of 2 or more and L is an integer of 1 or more; and

an arithmetic unit for multiplying, by a gain, configured to multiply each of the values
from the 1-rank differential to the L-rank differential to be outputs of calculated by the N-order
filter processing section respectively by a corresponding one of gains, and then adding sum all of
them up the resulting products,

wherein L is an order of denominator of a transfer function of an approximation model
that represents the controlled object with Laplace operator, and

wherein N is equal to or greater than a value defined by subtracting an order of the
command from L.

4. (canceled)

5. (currently amended): The optimum command producing apparatus according to
claim 3 any one of claims 1 to 3, wherein a recursive type filter or a non-recursive type filter is
used for the N-order filter ~~and an order N of the N-order filter is set to be an order or more which~~
~~is necessary for converting the command to be L-rank differentiable.~~

6. (original): The optimum command producing apparatus according to claim 1,
wherein the optimum command value is one of a position command, a speed command, an
acceleration command and a torque command or a combination thereof.